WHAT IS CLAIMED IS:

1. A high crystalline polypropylene microporous membrane satisfying one or more physical properties selected from the group consisting of a crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, an atatic fraction of less than 5%, a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, and a crystallization temperature of 125 ℃ or more.

2. The high crystalline polypropylene microporous membrane according to claim 1 having 500 sec/100 cc or less of air permeability.

3. A preparation method of a microporous membrane comprising the steps of:

a) preparing a high crystalline polypropylene precursor film satisfying one or more physical properties selected from the group consisting of a crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, an atatic fraction of less than 5%, a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, and a crystallization temperature of 125 ℃ or more;

b) annealing the precursor film;

c) stretching the annealed precursor film at a low temperature;

d) stretching the low temperature stretched film at a high temperature;

and

e) heat setting the high temperature stretched film.

4. A high crystalline polypropylene separator for a lithium ion battery satisfying one or more physical properties selected from the group consisting of a crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, an atatic fraction of less than 5%, a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, and a crystallization temperature 125 ℃ or more.

5. The high crystalline polypropylene separator for a lithium ion

battery according to claim 4 having an air permeability of 500 sec/100 cc or less.

6. The high crystalline polypropylene separator for a lithium ion battery according to claim 4 having a melt-integrity temperature of 164 ℃ or more.

7. A high crystalline polypropylene separator for a lithium ion polymer battery satisfying one or more physical properties selected from the group consisting of a crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, an atatic fraction of less than 5%, a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, and a crystallization temperature of 125 ℃ or more.

8. The high crystalline polypropylene separator for a lithium ion polymer battery according to claim 7 prepared by coating a gel phase polymer electrolyte on both sides of the separator.

9. The high crystalline polypropylene separator for a lithium ion polymer battery according to claim 7 having an air permeability of 500 sec/100 cc or less.

10. The high crystalline polypropylene separator for a lithium ion polymer battery according to claim 7 or claim 8 having a melt-integrity temperature of 164 ℃ or more.

11. The high crystalline polypropylene separator for a lithium ion polymer battery according to claim 8, wherein the gel phase polymer electrolyte is one or more materials selected from the group consisting of polyvinylidene fluoride, polyvinylidene fluoride chlorotrifluoroethylene, polyvinylidene fluoride hexafluoropropylene copolymer, polyethylene oxide, polypropylene oxide, polyurethane, polyacrylonitrile, polymethylacrylate, polyacrylamide, polyvinylacetate, polyvinylpyrrolidone, polytetraethylene glycol diacrylate, and copolymers or derivatives thereof.

12. A multi-component microporous membrane having a matrix of polypropylene prepared by stretching without using a solvent, wherein a

synthetic resin component of the multi-component microporous membrane comprises a) 70 to 99 weight% of polypropylene; and b) 1 to 30 weight% of one or more polymers selected from the group consisting of poly(ethylene-butylene) copolymer, poly(ethylene-hexene) copolymer, poly(ethylene-octene) copolymer, polyethylene prepared by metallocene catalysts, poly(ethylene-vinylacetate) copolymer, poly(styrene-ethylene) copolymer, poly(styrene-butylene-styrene) copolymer, poly(styrene-ethylene-butylene-styrene) copolymer, silane group grafted polyolefin, maleic anhydride or acrylic acid grafted polyolefin, ionomer, and derivatives thereof.

13. The multi-component microporous membrane according to claim 12, wherein a) polypropylene is high crystalline polypropylene which has a number average molecular weight of 10,000 or more, and satisfies one or more physical properties selected from the group consisting of a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, a crystallization temperature of 125 ℃ or more, crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, and an atatic fraction of less than 5%.

14. The multi-component microporous membrane according to claim 12, wherein a) polypropylene is a blend of one or more polypropylenes selected from the group consisting of high crystalline polypropylenes each having a different number average molecular weight, weight average molecular weight or molecular weight distribution, and general purpose polypropylene.

15. The multi-component microporous membrane according to claim 12 having an air permeability 500 sec/100 cc or less.

16. The multi-component microporous membrane according to claim 12 having a melt-integrity temperature of 163 ℃ or more.

17. A battery separator comprising the multi-component microporous membrane of claim 12.

18. A lithium ion battery or a lithium ion polymer battery using

the multi-component microporous membrane of claim 12 as a separator.

19. A preparation method of a multi-component microporous membrane having a matrix of polypropylene prepared by stretching without using a solvent, comprising the steps of:

a) mixing synthetic resin raw materials in a ratio of

i) 70 to 99 weight% of polypropylene; and

ii) 1 to 30 weight% of one or more polymers selected from the group consisting of poly(ethylene-butylene) copolymer, poly(ethylene-hexene) copolymer, poly(ethylene-octene) copolymer, polyethylene prepared by metallocene catalysts, poly(ethylene-vinylacetate) copolymer, poly(styrene-ethylene) copolymer, poly(styrene-butylene-styrene) copolymer, poly(styrene-ethylene-butylene-styrene) copolymer, silane group grafted polyolefin, maleic anhydride or acrylic acid grafted polyolefin, ionomer, and derivatives thereof;

b) preparing a precursor film by feeding the mixed material into an extruder;

c) annealing the precursor film at a temperature of polypropylene melting point or less;

d) low temperature stretching the annealed film at an ordinary temperature or less;

e) high temperature stretching the low temperature stretched film at a temperature of polypropylene melting point or less; and

f) heat setting the high temperature stretched film under tension at a temperature of polypropylene melting point or less.

20. The preparation method of a multi-component microporous membrane according to claim 19, wherein i) polypropylene of the step a) is high crystalline polypropylene which has a number average molecular weight

of 10,000 or more, and satisfies one or more physical properties selected from the group consisting of a density of 0.905 g/cm^3 or more, a melting temperature of 164 ℃ or more, a crystallization temperature of 125 ℃ or more, crystallinity of 50% or more, isotacticity (pentad fraction) of 95% or more, and an atatic fraction of less than 5%.

21. The preparation method of a multi-component microporous membrane according to claim 19, wherein polypropylene of the step a) is a blend of one or more polypropylenes selected from the group consisting of high crystalline polypropylenes each having a different number average molecular weight, weight average molecular weight or molecular weight distribution, and general purpose polypropylene.